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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,394	07/19/2001	Gang Huang	HUANG 11-1-10	9912

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EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/909,394	HUANG ET AL.	
	Examiner	Art Unit	
	Sudhanshu C. Pathak	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *July 19th, 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *July 19th, 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-to-21 are pending in the application.

Drawings

2. Figure 1 should be designated by a legend such as "Prior Art" because only that which is known is illustrated.

   Correction is required.

Specification

3. The specification on Page 8, Paragraphs 19-20 & in Fig. 1, refers to "a digital receiver comprising a digital-to-analog (D/A) converter that converts a received quadrature amplitude modulated (QAM) signal in digital form to analog form; further discloses receiver functions such as demodulation, equalization, slicer and decoding being performed after the D/A conversion in the analog domain, however no description is provided in the specification as to how these functions are performed in the analog domain (no analog circuitry is provided). Furthermore, these functions are generally done in the digital domain and the received signal is generally analog which is converted to the digital domain (with a analog-to-digital (A/D) converter) for further processing (demodulation, equalization, slicer function and decoding).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

   The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 15-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The independent claim 15 refers to "a digital receiver comprising a digital-to-analog (D/A) converter that converts a received quadrature amplitude modulated (QAM) signal in digital form to analog form;", the claim (and specification, Fig. 1) further discloses receiver functions such as demodulation, equalization, slicer and decoding being performed after the D/A conversion in the analog domain, however no description is provided in the specification as to how these functions are performed in the analog domain (no analog circuitry is provided). Furthermore, these functions are generally done in the digital domain and the received signal is generally analog which is converted to the digital domain (with a analog-to-digital (A/D) converter) for further processing (demodulation, equalization, slicer function and decoding).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-7 (system), 8-14 (method) are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Turner et al. (4,562,425) in further view of Riess et al. (US-PGPUB 2002/0037062).

Regarding to Claims 1-14, The Applicant Admitted Prior Art (AAPA) discloses a communication system comprising a zero-amplitude symbol constitutes an end-of-file symbol or separate subframes according to a Home Phoneline Networking Alliance standard using quadrature amplitude modulation (QAM) technique to more efficiently transfer the information across the network (Specification, Page 1, Paragraph 2, lines 1-10 & Specification, Page 2, Paragraphs 3-4). However, the AAPA does not disclose a QAM constellation comprising a zero amplitude symbol and further an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol as being a zero-amplitude symbol when said candidate symbol is closer to an origin of said constellation than to symbols proximate thereto.

Turner discloses a system of transmitting data through a communication channels implementing a QAM modulation techniques (Column 1, lines 45-68 & Column 2, lines 31-60 & Column 3, lines 60-68 & Fig.'s 1-3, 16). Turner also discloses a QAM constellation comprising a zero amplitude symbol (Column 4, lines 55-68 & Column 5, lines 1-20, 39-56 & Fig.'s 4-5, 8, 14-15). Turner also discloses the constellation is arranged on a Cartesian plane (Fig. 1-4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Turner teaches implementing a QAM comprising a zero-amplitude symbol at the origin of the constellation, and this can be implemented in the system as described in the AAPA so as to represent a certain specified information according to the

HomePNA standard as further described in the AAPA, thus satisfying the limitation of the claims. Furthermore, it is known to one of ordinary skill in the art at the time of the invention that a 16-QAM constellation is arranged on a Cartesian plane. However, the AAPA in view of Turner does not disclose an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol as being a zero-amplitude symbol when said candidate symbol is closer to an origin of said constellation than to symbols proximate thereto.

Riess discloses a data processing system wherein the source may generate data for transmission over a channel to the receiver (Fig. 1 & Specification, Paragraph 3). Riess also discloses implementing higher order constellations for the data processing systems such as various QAM modulation techniques (Specification, Paragraphs 8, 49-50, 97 & Fig. 3f-g). Riess also discloses an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol (Fig. 7, elements 310, 330 & Fig. 9, elements 430, 410 & Fig. 8, elements 3010-3030 & Specification, Paragraphs 22-44, 48-62). Riess also discloses a method of determining a received to be a reliable symbol by determining the proximity of the received symbol to the closest constellation point (Specification, Paragraphs 30-34). Riess also discloses in a 16-QAM constellation the closest symbol points to the origin, are number four in quantity, and are located at relative amplitude of (1, 1), (1,

-1), (-1, 1), (-1, -1) (Specification, Paragraphs 23, 50 & Fig. 3e). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Riess teaches implementing a method for determining a received symbol by determining the proximity of the received symbol to a symbol point on the modulation constellation and this can be implemented in the system as described in the AAPA in view of Turner so as to determine the zero amplitude symbol in the HomePNA standard as further described in the AAPA in view of Turner, thus satisfying the limitation of the claims.

8. Claims 15-21 (receiver) are rejected under 35 U.S.C. 103(a) as being unpatentable over Alelyunas et al. (6,553,087) in view of the Applicant Admitted Prior Art (AAPA) in further view of Turner et al. (4,562,425) in further view of Riess et al. (US-PGPUB 2002/0037062).

Regarding to claims 15-21, Alelyunas discloses a digital receiver comprising an A/D converter that converts a received signal analog form to digital form (Fig. 2, element 214); a demodulator, coupled to said A/D converter, that demodulates said digital signal (Fig. 2, element 216); an equalizer, coupled to said demodulator, that equalizes said digital signal (Fig. 2, element 218); a slicer, coupled to said equalizer, that recognizes and chooses from a set of possible valid receivable levels a level, or "point"; which most closely matches the current received signal level (Fig. 2, element 220); and a decoder converts this selected point to a set of bits in a bit stream depending on the protocol (inverse of the encoder) (Fig. 2, element 222). Alelyunas also discloses implementing the receiver in a HPNA (Home Phoneline Network Alliance) standard (Column 1, lines 48-65). However, Alelyunas does not disclose

transmitting/receiving a QAM signal further comprising a zero-amplitude symbol so as to represent an "end -of- file" or for separating subframes according to the "HPNA" standard, and further a decoder for a zero amplitude symbol.

The Applicant Admitted Prior Art (AAPA) discloses a communication system comprising a zero-amplitude symbol constitutes an end-of-file symbol or separate subframes according to a Home Phoneline Networking Alliance standard using quadrature amplitude modulation (QAM) technique to more efficiently transfer the information across the network (Specification, Page 1, Paragraph 2, lines 1-10 & Specification, Page 2, Paragraphs 3-4). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention that the AAPA teaches "HPNA" standard to have a symbol to represent an "end-of-file" or an "end-of-subframe" condition, and this can be transmitted in the transceiver as describe in Alelyunas. However, Alelyunas in view of AAPA does not disclose a QAM constellation comprising a zero amplitude symbol and further an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol as being a zero-amplitude symbol when said candidate symbol is closer to an origin of said constellation than to symbols proximate thereto.

Turner discloses a system of transmitting data through a communication channels implementing a QAM modulation techniques (Column 1, lines 45-68 & Column 2, lines 31-60 & Column 3, lines 60-68 & Fig.'s 1-3, 16). Turner also discloses a QAM constellation comprising a zero amplitude symbol (Column 4, lines

55-68 & Column 5, lines 1-20, 39-56 & Fig.'s 4-5, 8, 14-15). Turner also discloses the constellation is arranged on a Cartesian plane (Fig. 1-4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Turner teaches implementing a QAM comprising a zero-amplitude symbol at the origin of the constellation, and this can be implemented in the system as described in Alelyunas in view of AAPA so as to represent a certain specified information according to the HomePNA standard as further described in the Alelyunas in view of AAPA, thus satisfying the limitation of the claims. Furthermore, it is known to one of ordinary skill in the art at the time of the invention that a 16-QAM constellation is arranged on a Cartesian plane. However, the Alelyunas in view of AAPA in further view of Turner does not disclose an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter, associated with said amplitude detector, that recognizes said candidate symbol as being a zero-amplitude symbol when said candidate symbol is closer to an origin of said constellation than to symbols proximate thereto.

Riess discloses a data processing system wherein the source may generate data for transmission over a channel to the receiver (Fig. 1 & Specification, Paragraph 3). Riess also discloses implementing higher order constellations for the data processing systems such as various QAM modulation techniques (Specification, Paragraphs 8, 49-50, 97 & Fig. 3f-g). Riess also discloses an amplitude detector that extracts a candidate symbol from said signal and locates said candidate symbol relative to constellation of symbols; and zero-amplitude symbol interpreter,

associated with said amplitude detector, that recognizes said candidate symbol (Fig. 7, elements 310, 330 & Fig. 9, elements 430, 410 & Fig. 8, elements 3010-3030 & Specification, Paragraphs 22-44, 48-62). Riess also discloses a method of determining a received to be a reliable symbol by determining the proximity of the received symbol to the closest constellation point (Specification, Paragraphs 30-34). Riess also discloses in a 16-QAM constellation the closest symbol points to the origin, are number four in quantity, and are located at relative amplitude of (1, 1), (1, -1), (-1, 1), (-1, -1) (Specification, Paragraphs 23, 50 & Fig. 3e). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Riess teaches implementing a method for determining a received symbol by determining the proximity of the received symbol to a symbol point on the modulation constellation and this can be implemented in the system as described in the Alelyunas in view of AAPA in further view of Turner so as to determine the zero amplitude symbol in the HomePNA standard as further described in the Alelyunas in view of AAPA in further view of Turner, thus satisfying the limitation of the claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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